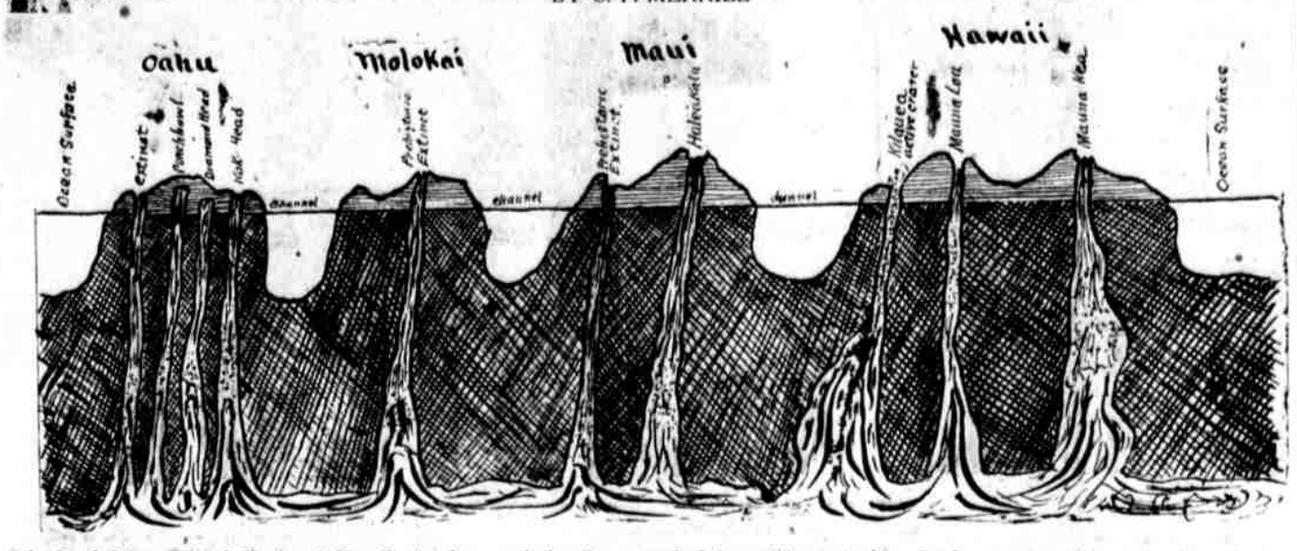
DARING SCIENTISTS DELVE DEEP INTO MYSTERIES OF HAWAII'S GREAT VOLCANOES; INTERESTING THEORIES EVOLVED ON ACTIVITIES

BY C. F. MERRILL



Islands of Oahu, Molokai, Maui and Hawaii, showing, conjecturally, a part of the earth's crust with volcanic vents or safety valves from the fires in the interior of the earth. Heavy shaded portion is earth's crust below surface of ocean.

Why Islands' Craters Are "Good" and No Danger Is Felt.

(Special Bulletin Correspondence.)

HILO, Hawaii, June 20.—Kilauea is furnishing a magnificent spectacle now for the tourists that come here to see the famed Volcano. Moreover, the recent discoveries and experiments by the experts who are living at the Volcano and studying its "habits" are arousing widespread interest, and some theories are being envolved that will be discussed all over the world.

Kilauea, although the largest active volcano in the world, is a good volcano. What it did in the dim past, far back of any historical record, is not known. But if it did get on a "rampage" as did Vesuvius, Etna and Mont Pelee it may again become quite active and nearly everybody who visits Kilauea for the first time and sees the everlasting marks of great convulsions of the past is minded to tread easy lest he call to life the powers that are beneath him and he be forced to become an unwilling witness to nature's most terrible phenomena. This feeling of respective and reverence for Madame Pele's retort is enhanced many-fold by the steam-racks through which scalding steam issues, showing that the cause is not far below one's feet, and at the same time these steam cracks are in some cases miles from the boiling pit whose waves of molten lava, when not broken by founts, many feet high, wash from shore to shore of the pit; at times seeming to reach up and pull down to its embrace large portions of the restraining wall.

No Calamities from Kilauea.

While it is true that the volcanoes of Hawaii have at different times within the memory of men living today overflowed their pits and caused a certain amount of destruction, and in one instance threatening the principal city of that island, there have been no frightful calamities such as have accompanied the eruptions of Vesuvius and that within our own recollection of Mont Pelee, which completed its work of destruction in about the same number of minutes that it took Vesuvius days to destroy the Roman city.

While the fires of Kilauea rise and fall continually, never at any length of time holding at a certain tide-mark, there is but one record of the fires disappearing completely. That was in the month of March, 1866, according to Mr. Thrum, the historian. While the fires were sunk out of sight, great rumblings and a series of earthquakes kept one reminded that Kilauea was still doing business even if it was in the basement.

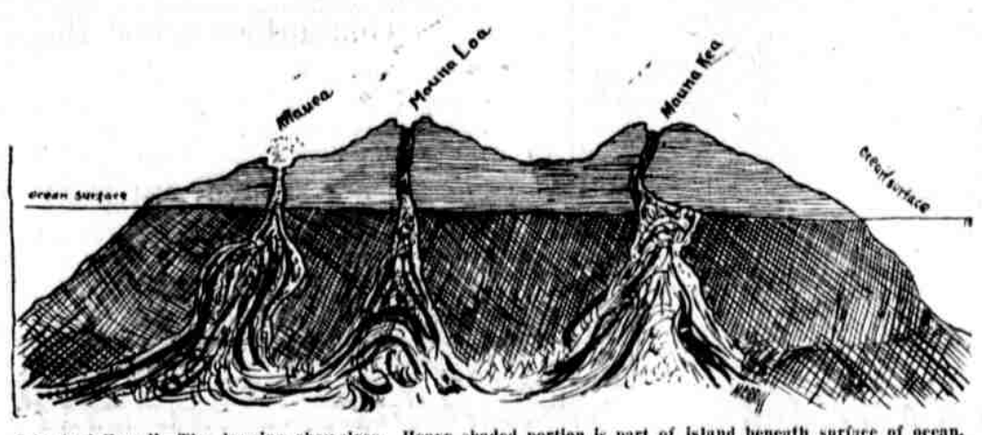
According to Hawaiians, the amount of deposits of "Pele's hair" has been steadily increasing of late, which foretells increased activity in the crater. Pele's hair is a threadlike filament—a glasslike composition which is a product of the fires in the pit and resembles a mass of matted hair, being brought up with the heat currents and deposited on the lava rocks of the crater.

Scientific research has demonstrated the fact that in the formation of a new volcano there is no great and sudden upheaval of rocks, as was at one time supposed to occur. The world carries no record of any eye that has watched the birth of a volcano. Still it is very clearly and concisely shown that the first act in the advent of a volcano is the earthquake which is responsible for an opening in the earth's crust. The admission of water at once creates gases of different density which form vapors and gently but firmly force the crust, as in slow-cooking mush. After a vent has once been formed, explosions succeed each other rapidly. A volcano that has, to use a slang phrase, got its stride, and is of the spouting variety, has great force within its depths. This in larger part is due to gases that escape perfect combustion. The force behind solid bodies that are thrown from volcanoes is enormous. The volcano of Cotopaxi, in the Andes, has a record of throwing a block weighing 200 tons a distance of nine miles.

Lava Last Composition.

Lava is the last composition to come from a volcano. Everything of what might be considered a foreign substance, such as stones, dust, salses and rubble, is exhausted before lava is brought to the surface or thrown out. The movement of lava, when once it overflows the rim of the crater, all depends on the incline it finds.

Records of flows on Hawaii show the fact that visitors walked leisurely ahead of the lava wave with no danger threatening, and this has given rise to the idea that lava moves slowly. Vesuvius has a record of spilling some lava over its sides that ran three miles in four minutes.



Island of Hawaii—The drawing shows the volcanoes. Heavy shaded portion is part of island beneath surface of ocean. Arrows the volcanoes that act as safety valves, conjecturally, this island above and below the surface of the ocean, with

Experts at Work.

The vulcanologists are again at their post at Kilauea, delving into terrestrial physics but largely conjectural will be our knowledge of the causes of the two great convulsions of nature, the volcano and the earthquake. We know, or think we know, that the interior of the earth is liquid, and judging from the increase of temperature as one sinks deeper through the earth's crust and, beginning at a point some thirty miles from the crust, it is the consensus of opinion of the scientists that all beyond that point is a seething, swirling mass with a temperature so high that solids of any nature must yield and become a part of the mass.

Allowing that the whole center of the earth is a boiling mass, according to the simplest of physics, there must be a vent, a safety-valve, as it were, and in such capacity the volcano acts. Without this escape vent for the pent-up energy it is probable that the earth's crust would be burst asunder, and other occurrences take place that would tend to make the surface of the earth a most uncomfortable place to live.

Two Classes of Eruptions.

Eruptions of volcanoes are of two classes—the explosive class and the quiescent. Vesuvius is of the former class and is occasioned by the presence of large solids or partial solids that are not in a complete fluid condition, and being forced to the top by the energy of the molten mass below, gradually fill the vent and in time the large volume of vapors that generate below burst through the line of least resistance, carrying everything with them to great heights above the earth's surface.

When the quiet types of volcanos get into a state of eruption the lava comes to the surface in a decidedly liquid form, thoroughly fused, and will flow down an incline with the freedom of water. Such a volcano is Kilauea. The mass that fills the conduit (call it so for want of a better term) of Kilauea is thoroughly liquefied and gives very little room for the accumulation of gases, and even the latter forming escaping without explosions or violent demonstrations.

Within the knowledge of living men today are instances where volcanoes have blown their heads off. The volcano of Coseguina, in Nicaragua, is such a one. In 1835 this volcano, known as an explosive volcano, worked itself into a state of eruption. As described elsewhere, the conduit of this volcano became clogged with rock and earth which did not readily give way to the fast-generating mass below, with the result that the summit portion, a number of miles in circumference and a few thousand feet high, was completely blown away. And in recent years, so short a time ago as 1883, the volcano of Krakatoa, in the Straits of Sunday, blew itself all to pieces, and so complete was the work that the whole mountain disappeared.

It does not seem that we are to know much more about the motive power that is beneath the lava than we do about that city in the beyond whose streets are paved with gold, whence no traveler returns. Hardly do the geologists settle to their satisfaction the theory of eruptions than some distant volcano gets to work and knocks their theories into a cocked hat. The latest along this line of research is that the shrinking and cooling of the inner mass causes fractures in the outer portions of the earth's crust. The molten mass, ever seeking a relieving channel, rushes into the fissures, meeting the water-charged rocks, the result being increased amounts of gases and steam, which, if not accommodated by the usual vent or conduit, must force out, and the result is the eruption.

The Flattest Volcano.

Not only does Kilauea enjoy the distinction of being the largest active volcano in the world, but it can also lay claim to being the flattest volcano. It is at the end of the two extremes. Cotapaxi is the loftiest volcano in the world, being 20,100 feet, its slope being very similar to fool's-cap, and the whole rising from a plateau. Cotapaxi is classed as the wickedest of all volcanoes, and Kilauea as one of the quietest.

The toll of human life exacted by the known volcanoes of the world is terrible to contemplate. The following will give some idea of this toll:

B. C. 285—Japan, 800 square miles engulfed and volcanic eruption; many thousands killed.

A. D. 63—Italy, Pompeii partly destroyed, large numbers killed.

A. D. 79—Eruption of Vesuvius, Pompeii completely buried; most of inhabitants killed.

A. D. 526—Earthquake and volcanic eruption; 250,000 killed.

A. D. 893—Earthquake and volcanic eruption; 180,000 killed.

1456—Eruption and quake at Naples, 60,000 killed.

1703—Quake, Yeddo, 190,000 killed.

1772—Java, volcanic eruption, 3000 killed.

1773—Quake, Guatemala, 33,000 killed.

1783—Calabria, quake, 40,000.

1783—Iceland, volcanic eruption, 10,000 killed.

1798—Quake, Ecuador, 41,000 killed.

1815—Volcanic eruption on Island of Sunbawa, 12,000 killed.

1822—Quake at Aleppo, 120,000 killed.

1822—Java, volcanic eruption, 4000 killed.

1857—Naples, 30,000 killed.

1883—Krakatoa, volcanic eruption, 36,000 killed.

1891—Hondo, Japan, 10,000 killed.

1902—St. Pierre, Martinique, volcanic eruption, 30,000 killed.

1902—St. Vincent Isle, volcanic eruption, 1600 killed.

Moving on to a less gloomy subject, a glance at the accompanying drawings will give a fairly good idea of the "land we live in." One of these shows the Island of Hawaii, with its three safety-vents. It will be observed that Kilauea is the only vent that is open clear to the top, but that the obstruction now existing in Mauna Loa and Mauna Kea is of a nature and consistency that will quickly give way to the pressure beneath when Kilauea is not equal to carrying off safely the gases and steam that may generate.

The other drawing shows the Islands of Oahu, Molokai, Maui and Hawaii, with a few of the volcanoes that are at present considered extinct, but are, nevertheless, very attractive to the tourist, as well as to island people.

FIRE BURNS DOWN A RESTAURANT

At about 2 o'clock this morning a fire broke out in the restaurant and bakery of Quong Lee Kee, Vineyard street, near Camp No. 2. The fire department responded promptly, and although the building was burned down, the frame tenements in the vicinity were saved from destruction.

The fire, according to Chief Thurston, started from a charcoal pile of the shop. The loss is about $300, covered by a policy for $900.

The Canadian Minister of Finance announced that the government would discontinue putting out $4 banknotes and fractional paper currency.

SCHOOL HYGIENE AS A SCIENCE

National Exhibit Will Be Held In Washington Next September.

How to wash the air; why the color of the wall affects a child's vision; the "curve of learning"; and the operation of the aesthesiometer and ergograph are among the exhibits to be made by the United States Bureau of Education at the first exhibition ever given in America which deals with the general field of public health. The bureau's exhibit will show the hygiene of the school and the school child, as part of the exhibition to be held before the Fifteenth International Congress on Hygiene and Demography, meeting in Washington, D. C., next September.

Among other advance information just given out, the education bureau specialists who have the school hygiene exhibit in charge, make the statement that one exhibit will show that stuttering is about three times as common among boys as among girls.

"The bureau of education's exhibit is divided into sections. The first of these considers the hygiene of the school child, taking up such subjects as food, sleep and clothing. With the cooperation of school architects and makers of school furniture and school appliances from all over the country, the bureau is also preparing exhaustive exhibits on the hygiene of the school building and the hygiene of instruction. Other sections of the school hygiene exhibit will take up the hygiene of physical defects, the medical inspection of school children, and open-air schools.

CHRISTIAN SCIENCE LECTURE.

Perhaps no subject is more widely discussed today than Christian Science. In inviting the public to attend the free lecture at the Hawaiian Opera House tomorrow evening at 8 o'clock the Christian Scientists of Honolulu feel that they are giving to those interested an opportunity to hear a clear statement of its teachings. The lecturer, Mr. Bliss Knapp, is a member of the Board of Lectureship of the Mother Church, The First Church of Christ, Scientist, in Boston, Mass., and comes prepared to speak with authority upon the subject.